

REMARKS

Claims 1-43 are pending. Claims 1-3, 7-9, 12, 15, 16, 18, 19, 23-26, 28, 33, 39-41 and 43 have been rejected, and claims 4-6, 10, 11, 13, 14, 17, 20-22, 27, 29-32, 34-38 and 42 have been objected to as being dependent upon a rejected base claim. New dependent claims 44 and 45 are being added. As a result, claims 1-45 are pending for examination with claims 1, 7, 16, 23, 39, 40, and 41 being independent claims. No new matter has been added.

Amendments to the Claims

No amendments have been made to claims 1-36 and 38-43. Claim 37 was previously amended. New dependent claims 44 and 45 are directed to alternative embodiments of the invention. Claim 44, which depends from original claim 1, recites in part that the range of the fluid variable is reestablished in response to the fluid variable exceeding a threshold of the range. New claim 44 is supported by the specification as filed, for example, at page 5, lines 9-13. New claim 45, which depends from original claim 1, recites in part that the range of the fluid variable is established relative to a nominal operating value of the fluid variable. New claim 45 is supported by the application as filed, for example, at page 5, lines 2-5. Accordingly, no new matter has been added by the new dependent claims.

Rejections Under 35 U.S.C. §102

The Examiner rejected claims 1-3, 7-9, 12, 15, 16, 18, 19, 23-26, 28, 39-41 and 43 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,668,948 to Merkel ("Merkel.") Applicants respectfully submit, however, that Merkel does not invalidate any one of these claims because Merkel does not disclose or suggest all of the features recited by any one of independent claims 1, 7, 16, 23, 39, 40 and 41. This conclusion is supported by the following reasons.

The independent claims include claims 1, 7, and 39 directed to methods, claim 40 directed to a computer readable medium encoded with a program that performs a method, and claims 16, 23, and 41 directed to devices. Claim 1 recites establishing a range beyond which a fluid variable is expected to vary within a predetermined time interval, and indicating a plugged sensor port in response to the measured fluid variable remaining within the range for the

predetermined time interval. Claim 7 recites determining a range beyond which a fluid variable is expected to vary within a predetermined time interval, and indicating that a port connection is plugged in response to the fluid variable remaining within the range for the predetermined time interval. Claim 39 recites detecting a plugged sensor port based on a measured fluid variable remaining within a predetermined range for a predetermined period of time, and actuating a clearing mechanism to clear the plugged port in response to the detection. Independent claim 40 recites determining a range beyond which a fluid variable is expected to vary within a predetermined time interval, and indicating a plugged port condition in response to the fluid variable remaining within the range for a predetermined time interval.

Claim 16 recites a controller that establishes a range beyond which a fluid variable is expected to vary within a predetermined time interval, and that indicates a plugged sensor port in response to the measured fluid variable remaining within the range for the predetermined time interval. Claim 23 recites the limitation of a means for determining a range beyond which a fluid variable is expected to vary within a predetermined time interval, and a means for indicating a plugged sensor port in response to the measured fluid variable remaining within the range for the predetermined time interval. Claim 41 recites a controller that establishes a range beyond which a fluid variable is expected to vary within a predetermined time interval, and that indicates a fault condition in response to the measured fluid variable remaining within the range for a predetermined time interval.

As described in more detail below, Merkel does not disclose or suggest every feature of any one of independent claims 1, 7, 16, 23, 39, 40 and 41 for any one of at least three reasons. **First**, Merkel is directed at detection of clogged or worn dispenser nozzles, not plugged sensor ports, or plugged port connections, as recited by each of claims 1, 7, 16, 23, 39 and 40. **Second**, Merkel teaches that a fault is detected when a pressure falls outside of a preselected pressure range, not when a fluid variable remains within a range, as recited by each of claims 1, 7, 16, 23, 39, 40 and 41. **Third**, Merkel fails to disclose or support detection or indication of a fluid variable remaining within a range for a predetermined time interval, as recited by each of claims 1, 7, 16, 23, 39, 40 and 41.

First, Merkel does not anticipate or render obvious any one of claims 1, 7, 16, 23, 39 and 40 because Merkel does not relate to plugged sensor ports, or plugged port connections, as recited by each of claims 1, 7, 16, 23, 39 and 40. In contrast, Merkel is directed only at detection of clogged or worn fluid dispenser nozzles. Merkel discloses a dispensing system that includes a dispenser (20) having a nozzle (26) through which a fluid flows; the system includes a sensor (40) affixed to the dispenser (20) to indicate the pressure in the dispenser (20). See, e.g., Merkel, column 3, lines 16-27. Merkel teaches that pressure measurements from the sensor (40) are used to detect a clogged or worn nozzle (26) through which fluid flows from the dispenser (20). See, e.g., Merkel, column 3, lines 42-45. Merkel does not, however, teach an indication or detection of a plugged sensor port, or port connection, as recited by each of claims 1, 7, 16, 23, 39 and 40. Rather, Merkel teaches that the value of the pressure of fluid in the dispenser (20) is compared to a preselected pressure that indicates a clogged nozzle (20) of the dispenser, not a clogged port of the sensor (40). See Merkel, column 3, lines 42-44 (stating that the “magnitude or value of pressures against which the sensor signal is compared are preselected empirically to be reflective of nozzle 22 being clogged or worn”).

A sensor port, as recited by each of claims 1, 16, 23, 39, and 40, and a nozzle, as taught by Merkel, are distinct structural features that serve distinct functions. The claimed sensor port only provides a connection site for a sensor. It does not dispense any fluid. See specification, page 1, lines 8-10 (stating that “a system contains a fluid...that is monitored by a sensor mechanism through a sensor port in the apparatus.”) In contrast, Merkel teaches a nozzle that is an opening in a dispenser through which fluid flows to be dispensed by the dispenser. See, e.g., Merkel, column 1, lines 16-18 (stating that “the dispenser may include a valve which permits fluid to pass through a discharge opening such as a nozzle”). Therefore, the nozzle taught by Merkel does not suggest the claimed sensor port because the nozzle provides a path for flow of a fluid from a dispenser while a sensor port only provides a site of attachment of a sensor it does not dispense any fluid.

Second, Merkel does not anticipate or render obvious any one of claims 1, 7, 16, 23, 39, 40 and 41 because Merkel does not disclose an indication or determination of a plugged port, or

fault condition, in response to a measured variable remaining within a range, as recited by each of claims 1, 7, 16, 23, 39, 40 and 41. Merkel, rather, teaches that a malfunction is indicated when the pressure sensor (40) detects a pressure in the dispenser that is outside a pressure range, not within a range. See, e.g., Merkel, column 2, lines 43-46 (stating that “[w]hen the operation signal indicates the dispenser is open, [i.e., intended to dispense fluid through the nozzle (26),] the monitor will generate a malfunction signal if the pressure signal is not on or between the first and second pressures”) (emphasis added); see, also, Merkel, column 7, lines 39-45 (reciting that “fluid pressure in the dispenser which exceeds the preselected range...indicates a worn nozzle...fluid pressure in the dispenser **20** which is below the preselected range...generally indicates a clogged nozzle”) (emphasis added); see, also, Merkel column 3, lines 54-56 (stating that “[i]f the magnitude of the shaped [sensor] signal is outside the range of preselected pressure values, a malfunction signal is supplied”) (emphasis added.)

Merkel not only does not teach the feature of an indication or determination of a plugged port, or fault condition, in response to a measured variable remaining within a range, Merkel does not suggest or motivate a modification of its teachings to render the claimed feature obvious. Rather, Merkel actually teaches away from this claimed feature because, as described above, Merkel explicitly teaches that a malfunction is indicated only when the pressure sensor (40) detects a pressure outside a pressure range.

Third, Merkel does not anticipate or render obvious any one of claims 1, 7, 16, 23, 39, 40 and 41 because Merkel does not teach or suggest an indication or determination of a plugged port, or fault condition, in response to a measured fluid variable remaining within an established range for a predetermined time interval, as recited by each of claims 1, 7, 16, 23, 39, 40 and 41. Moreover, Merkel does not teach an established or determined range beyond which a fluid variable is expected to vary during the predetermined time interval, as recited by each of claims 1, 7, 16, 23, 39, 40 and 41. Rather, Merkel teaches that a plugged nozzle occurs whenever the sensor signal is outside the range of pre-selected pressure valve, regardless of the length of time.

For the above reasons, Applicants respectfully submit that Merkel does not disclose or suggest a plugged sensor port, or plugged port connection, as recited by each of claims 1, 7, 16,

23, 39 and 40, or an indication or determination of a plugged port, or fault condition, in response to a measured variable remaining within a range, as recited by each of claims 1, 7, 16, 23, 39, 40 and 41, or an indication or determination of a plugged port, or fault condition, in response to a measured fluid variable remaining within an established range for a predetermined time interval, as recited by each of claims 1, 7, 16, 23, 39, 40 and 41. Therefore, independent claims 1, 7, 16, 23, 39, 40 and 41 are patentable over Merkel. Because claims 1, 7, 16, 23, 39, 40 and 41 are patentable over Merkel, Applicants submit that claims 2, 3, 8, 9, 12, 15, 18, 19, 24-26, 28, 41 and 43, which depend directly or indirectly from claim 1, 7, 16, 23, 39, 40 or 41, are patentable as well, for at least the same reasons. Therefore, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-3, 7-9, 12, 15, 16, 18, 19, 23-26, 28, 39-41 and 43 under 35 U.S.C. §102(b).

Rejections Under 35 U.S.C. §103

The Examiner rejected claim 33 under 35 U.S.C. §103(a) as being obvious over Merkel in view of U.S. Patent No. 4,555,712 to Arway et al. ("Arway.") As described above, independent claim 28 is novel over Merkel. For the reasons described below, Arway does not remedy the deficiencies of Merkel.

Arway is directed to the use of a valve to introduce a solvent into a process solution to reduce the viscosity of the process solution to maintain a nominal flow rate. Arway teaches measurement of the length of time required for a given volume of ink to flow through an ink jet nozzle. Arway further teaches that a solvent is injected into the ink to maintain the proper viscosity of the ink so that the desired flow rate is achieved. Arway does not disclose or suggest clearing a plugged port, as recited in claim 33, or the other limitations of claim 28. Rather, Arway et al. uses a solvent to maintain the proper viscosity of the ink in a nozzle which dispenses ink. Arway suffers from the same deficiencies as Merkel and fails to cure these deficiencies.

Therefore, claim 33, which depends indirectly from claim 28, is unobvious over Merkel in view of Arway. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claim 33 under 35 U.S.C. §103(a).

New Claims 44 and 45 in View of the Cited Art

New claim 44, which depends from claim 1, recites in part that the range of the fluid variable is reestablished in response to the fluid variable exceeding a threshold of the range. For the same reasons described above for claim 1, claim 44 is patentable and in condition for allowance in view of the cited references. Moreover, claim 44 is unobvious in view of Merkel and Arway also because neither Merkel nor Arway teaches or suggests reestablishing a range of a fluid variable in response to the variable exceeding a threshold of the range. Accordingly, Applicants respectfully request consideration and allowance of dependent claim 44.

Claim 45, which depends from original claim 1, recites in part that the range of the fluid variable is established relative to a nominal operating value of the fluid variable. For the same reasons described above for claim 1, claim 45 is patentable and in condition for allowance in view of the cited references. Moreover, claim 45 is unobvious in view of Merkel and Arway also because neither Merkel nor Arway teaches or suggests that the range of a fluid variable is established relative to a nominal operating value of the fluid variable. Accordingly, Applicants respectfully request consideration and allowance of dependent claim 45.

Allowable Subject Matter

Claims 4-6, 10, 11, 13, 14, 17, 20-22, 27, 29-32, 34-38 and 42 have been indicated to be allowable, although they depend from a rejected base claim.

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- 16 -

Art Unit: 2863

CONCLUSION

In view of the foregoing amendments and remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes, after this amendment, that the application is not in condition for allowance, the Examiner is requested to call the Applicant's attorney at the telephone number listed below.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

Respectfully submitted,
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